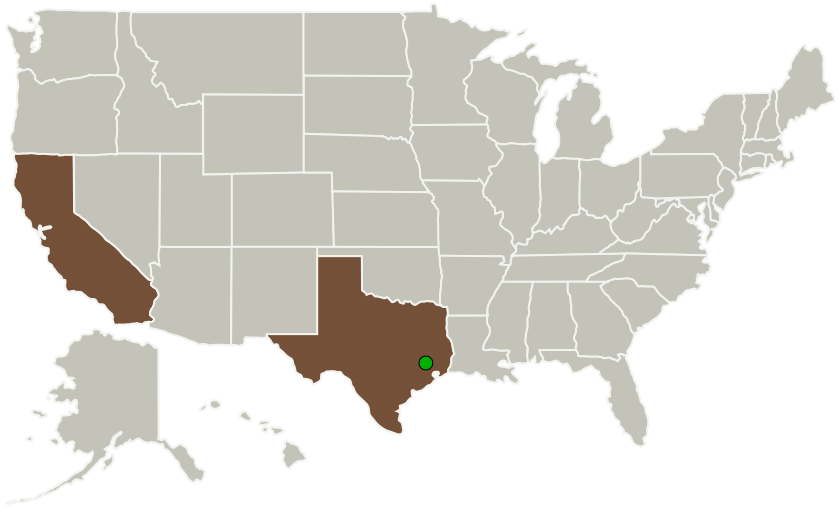
Advanced Cookware and Techniques for Food Preparation at Reduced Pressure and Gravity, Phase II

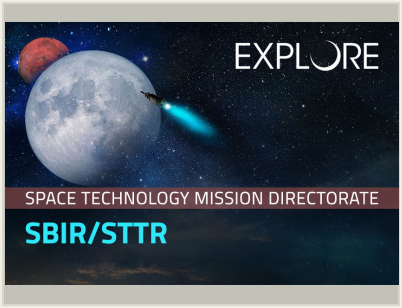
Completed Technology Project (2011 - 2014)

Project Introduction

Makel Engineering and Cornell University propose to develop a galley architecture taking into account the design constraints of the space habitat, such as reduced pressure and gravity, minimize size, mass, power and crew time, while producing food with high nutritional value and enough variety, acceptable taste and texture qualities for long term crew consumption. The current design of the space habitat will have a reduced atmospheric pressure of 8 psia which is equivalent to a 16,000 foot mountain top, with oxygen enrichment to prevent hypoxia effects on the crew. The combination of reduced pressure and gravity will affect the heat and mass transfer during food processing and food preparation of the food. Whether the food system is based chiefly on bulk packaged ingredients or crops grown on site, it must minimize mass, volume, power and waste, make effective use of the limited resource of crew time, produce nutritious, highly acceptable and varied food, and integrate into the closed habitat's atmospheric control system by containing and controlling airborne particulates, water vapor and odors generated during food preparation.

Primary U.S. Work Locations and Key Partners





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Small Business Innovation Research/Small Business Tech Transfer

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Organizations Performing Work	Role	Type	Location
Makel Engineering, Inc.	Lead Organization	Industry Small Disadvantaged Business (SDB)	Chico, California
Johnson Space Center(JSC)	Supporting Organization	NASA Center	Houston, Texas

Primary U.S. Work Locations	
California	Texas

Project Transitions

June 2011: Project Start

June 2014: Closed out

Closeout Documentation:

- Final Summary Chart*(https://techport.nasa.gov/file/138668)*

Organizational Responsibility

Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

Lead Organization:

Makel Engineering, Inc.

Responsible Program:

Small Business Innovation Research/Small Business Tech Transfer

Project Management

Program Director:

Jason L Kessler

Program Manager:

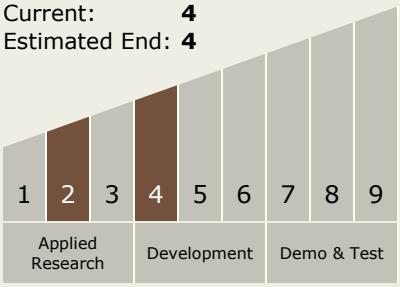
Carlos Torrez

Principal Investigator:

Susana Carranza

Technology Maturity (TRL)

Start: **2**
Current: **4**
Estimated End: **4**



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Technology Areas

Primary:

- TX06 Human Health, Life Support, and Habitation Systems
  - TX06.3 Human Health and Performance
    - TX06.3.5 Food Production, Processing, and Preservation

Target Destinations

The Sun, Earth, The Moon, Mars, Others Inside the Solar System, Outside the Solar System